

CLAIMS

1. A wireless communication device, comprising:
 - a directional wireless communication unit that performs a directional wireless communication with the other wireless communication device;
 - 5 a short-range wireless communication unit that performs a short-range wireless communication with the other wireless communication device based on a communication identification information for the short-range wireless communication; and
 - a control unit that controls the directional wireless communication unit
- 10 and the short-range wireless communication unit,
 - wherein the control unit includes:
 - a portion that establishes a directional wireless communication path to the other wireless communication device;
 - a portion that transmits the communication identification information to
 - 15 the other wireless communication device through the directional wireless communication path;
 - a portion that stores the communication identification information of the other wireless communication device when receiving the communication identification information of the other wireless communication device from the
 - 20 other wireless communication device; and
 - a portion that determines whether to permit a connection request for the short-range wireless communication, when receiving the connection request for the short-range wireless communication, based on comparison between the communication identification information of a wireless communication device
 - 25 which sends the connection request for the short-range wireless communication

and the stored communication identification information.

2. The wireless communication device according to claim 1, wherein the control unit includes:

5 a portion that stores authentication information when receiving the authentication information for the short-range wireless communication from the other wireless communication unit through the directional wireless communication path; and

a portion that performs authentication for the short-range wireless
10 communication based on the authentication information.

3. The wireless communication device according to claim 1 or 2, wherein the control unit includes:

a portion that produces authentication information for performing the
15 short-range wireless communication with the other wireless communication device;

a portion that transmits the authentication information for performing the short-range wireless communication to the other wireless communication device through the directional wireless communication path; and

20 a portion that performs authentication for the short-range wireless communication based on the authentication information.

4. The wireless communication device according to claim 2 or 3, wherein while performing the authentication, the authentication information of respective
25 wireless communication devices are required to be the same.

5. The wireless communication device according to any one of claims 1 to 4, wherein the communication identification information is assigned uniquely to the short-range wireless communication unit.

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6. A wireless communication device, comprising:

a directional wireless communication unit that performs a directional wireless communication with the other wireless communication device;

10 a short-range wireless communication unit that performs a short-range wireless communication with the other wireless communication device based on a communication identification information for the short-range wireless communication; and

a control unit that controls the directional wireless communication unit and the short-range wireless communication unit,

15 wherein the control unit includes:

a portion that establishes a directional wireless communication path to the other wireless communication device;

20 a portion that stores authentication information when receiving the authentication information for the short-range wireless communication from the second wireless communication unit through the directional wireless communication path;

a portion that establishes a short-range wireless communication path to the other wireless communication device; and

25 a portion that performs authentication for the short-range wireless communication based on the authentication information.

7. The wireless communication device according to claim 6, wherein the control unit includes:

5 a portion that produces authentication information for performing authentication in the short-range wireless communication with the other wireless communication device;

a portion that transmits the authentication information to the other wireless communication device through the directional wireless communication path; and

10 a portion that performs authentication for the short-range wireless communication based on the authentication information.

8. A wireless communication device, comprising:

15 a directional wireless communication unit that performs a directional wireless communication with the other wireless communication device;

a short-range wireless communication unit that performs a short-range wireless communication with the other wireless communication device based on a short-range communication identification information; and

20 a control unit that controls the directional wireless communication unit and the short-range wireless communication unit,

wherein the control unit includes:

a portion that establishes a directional wireless communication path to the other wireless communication device;

25 a portion that produces authentication information for performing authentication in the short-range wireless communication with the other wireless

communication device;

a portion that transmits the authentication information to the other wireless communication device through the directional wireless communication path;

5 a portion that establishes a short-range wireless communication path to the other wireless communication device; and

a portion that performs authentication for the short-range wireless communication based on the authentication information.

10 9. The wireless communication device according to any one of claims 6 to 8, wherein while performing the authentication, the authentication information of respective wireless communication devices are required to be the same.

10. The wireless communication device according to any one of claims 1
15 to 9, wherein the short-range wireless communication is Bluetooth(TM) or a wireless Local Area Network which enables communication within a predetermined range.

11. The wireless communication device according to any one of claims 1
20 to 10, wherein the directional wireless communication is implemented as one of an infrared communication, a visible light communication and a non-contact communication to provide one-to-one communication.

12. A wireless communication method, comprising:
25 establishing a directional wireless communication path for performing

directional wireless communication with the other wireless communication device;

transmitting communication identification information for a short-range communication to the other wireless communication device through the directional wireless communication path;

receiving, from the other wireless communication device, the communication identification information thereof;

storing the received communication identification information of the other wireless communication device; and

determining whether to permit a connection request for the short-range wireless communication when receiving the connection request for the short-range wireless communication based on comparison between the communication identification information of a wireless communication device which sends the connection request for the short-range wireless communication and the stored communication identification information.

13. The wireless communication method according to claim 12, further comprising,

receiving authentication information for the short-range wireless communication from the other wireless communication device through the directional wireless communication path;

storing the authentication information;

establishing a communication path for the short-range wireless communication to the other wireless communication device when the connection request for the short-range wireless communication is permitted;

and

performing authentication for the short-range wireless communication through the communication path based on the authentication information.

- 5 14. The wireless communication method according to claim 12 or 13, further comprising:

producing authentication information for performing the short-range wireless communication with the other wireless communication device;

transmitting the authentication information for the short-range wireless
10 communication to the other wireless communication device through the directional wireless communication path; and

performing authentication for the short-range wireless communication based on the authentication information.

- 15 15. The wireless communication method according to claim 13 or 14, wherein while performing the authentication, the authentication information of respective wireless communication devices are required to be the same.

16. The wireless communication method according to any one of claims 12
20 to 15, wherein the communication identification information is assigned uniquely to the short-range wireless communication unit.

17. A wireless communication method, comprising:
establishing a directional wireless communication path for performing a
25 directional wireless communication with the other wireless communication

device;

receiving authentication information for a short-range communication from the other wireless communication device through the directional wireless communication path;

5 storing the authentication information;

establishing a short-range communication path to the other wireless communication device; and

performing authentication for the short-range wireless communication through the short-range communication path based on the authentication
10 information.

18. The wireless communication method according to claim 17, further comprising:

producing authentication information for performing authentication in
15 the short-range wireless communication with the other wireless communication device; and

transmitting the authentication information to the other wireless communication device through the directional wireless communication path.

20 19. A wireless communication method, comprising:

establishing a directional wireless communication path to a second wireless communication device;

producing authentication information for performing authentication in a short-range wireless communication with the other wireless communication
25 device;

transmitting the authentication information to the other wireless communication device through the directional wireless communication path;

establishing a short-range communication path to the other wireless communication device; and

5 performing authentication for the short-range wireless communication through the short-range communication path based on the authentication information.

20. The wireless communication method according to any one of claims 17
10 to 19, wherein while performing the authentication, the authentication information of respective wireless communication devices are required to be the same.

21. The wireless communication method according to any one of claims 12
15 to 20, wherein the short-range wireless communication is Bluetooth(TM) or a wireless Local Area Network which enables communication within a predetermined range.

22. The wireless communication method according to any one of claims 12
20 to 21, wherein the directional wireless communication is implemented as one of an infrared communication, a visible light communication and a non-contact communication to provide one-to-one communication.